SEQUENCE LISTING

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McKeating, Jane A.
Dash, Srikanta
Coy, David H.

<120> FLAVIVIRUS FUSION INHIBITORS

<130> 12920.0014.PCUS00

<140> US 10/532,480
<141> 2005-04-22

<150> 60/424,746
<151> 2002-11-08

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<170> PatentIn version 3.4

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Tyr Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys
1 5 10 15

Pro Asn Ser Ser Ile Val Tyr Glu Ala Ala Asp Ala Ile Leu
20 25 30

<210> 2
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Cys Ser Ala Leu Tyr Trp Val Gly Asp Leu Cys Gly Ser Val Phe Leu
1 5 10 15

Val Gly Gln Leu Phe Thr Phe Ser Pro Arg Arg His Trp Thr Thr Gln
20 25 30

Asp Cys

<210> 3
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<400> 3

Ser Pro Arg Arg His Trp Thr Thr Gln Asp Cys Asn Cys Ser Ile Tyr
1 5 10 15

Pro Gly His Ile Thr Gly His Arg Met Ala Trp Asp Met Met Met Asn
20 25 30

Trp Ser Pro Thr
35

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Met Met Met Asn Trp Ser Pro Thr Ala Ala Leu Leu Arg Ile Pro Gln
1 5 10 15

Ala Ile Met Asp Met Ile Ala Gly Ala His Trp Gly Val Leu Ala Gly
20 25 30

Ile Lys Tyr Phe Ser Met Val Gly Asn Trp
35 40

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Arg Val Thr Asp Pro Asp Thr Asn Thr Thr Ile Leu Thr Asn Cys Cys
1 5 10 15

Gln Arg Asn Gln Val Ile Tyr Cys Ser Pro Ser Thr Cys Leu
20 25 30

<210> 6
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Arg Asp Phe Val Glu Gly Val Ser Gly Gly Ser Trp Val Asp Ile Val
1 5 10 15

Leu Glu His Gly Ser Cys Val Thr Thr Met Ala Lys Asn Lys Pro Thr
20 25 30

Leu Asp Phe
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<210> 7
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Arg Asp Phe Ile Glu Gly Ala Ser Gly Ala Thr Trp Val Asp Leu Val
1 5 10 15

Leu Glu Gly Asp Ser Cys Leu Thr Ile Met Ala Asn Asp Lys Pro Thr
20 25 30

Leu Asp Val
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<210> 8
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<400> 8

Arg Asp Phe Ile Glu Gly Val His Gly Gly Thr Trp Val Ser Ala Thr
1 5 10 15

Leu Glu Gln Asp Lys Cys Val Thr Val Met Ala Pro Asp Lys Pro Ser
20 25 30

Leu Asp Ile
35

<210> 9
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<400> 9

Arg Asp Phe Leu Glu Gly Val Ser Gly Ala Thr Trp Val Asp Leu Val
1 5 10 15

Leu Glu Gly Asp Ser Cys Val Thr Ile Met Ser Lys Asp Lys Pro Thr
20 25 30

Ile Asp Val
35

<210> 10
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<400> 10

Gly Gln Leu Ala Cys Lys Glu Asp Tyr Arg Tyr Ala Ile Ser Ser Thr
1 5 10 15

Asn Glu Ile Gly Leu Leu Gly Ala Gly Gly Leu Thr Thr Thr Trp Lys
20 25 30

Glu Tyr Asn
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<210> 11
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<400> 11

Gly His Leu Asp Cys Lys Pro Glu Phe Ser Tyr Ala Ile Ala Lys Asp
1 5 10 15

Glu Arg Ile Gly Gln Leu Gly Ala Glu Gly Leu Thr Thr Thr Trp Lys
20 25 30

Glu Tyr Ser
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<210> 12
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Gly Glu Phe Ala Cys Arg Glu Asp His Arg Tyr Ala Leu Ala Lys Thr
1 5 10 15

Lys Glu Ile Gly Pro Leu Gly Ala Glu Ser Leu Thr Thr Thr Trp Thr
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Asp Tyr Gln
35

<210> 13
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<400> 13

Thr Cys Asp Ala Leu Asp Ile Gly Glu Leu Cys Gly Ala Cys Val Leu
1 5 10 15

Val Gly Asp Trp Leu Val Arg His Trp Leu Ile His Ile Asp Leu Asn
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Glu Thr

<210> 14
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Lys Arg Phe Val Cys Lys His Ser Met Val Asp Arg Gly Trp Gly Asn
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Gly Cys Gly Leu Phe Gly Lys Gly Gly Ile Val Thr Cys Ala Met Phe
20 25 30

Thr Cys

<210> 15
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<400> 15

Ser Ser Tyr Val Cys Lys Gln Gly Phe Thr Asp Arg Gly Trp Gly Asn
1 5 10 15

Gly Cys Gly Leu Phe Gly Lys Gly Ser Ile Asp Thr Cys Ala Lys Phe
20 25 30

Ser Cys

<210> 16
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<400> 16

Gly Asp Asn Ala Cys Lys Arg Thr Tyr Ser Asp Arg Gly Trp Gly Asn
1 5 10 15

Gly Cys Gly Leu Phe Gly Lys Gly Ser Ile Val Ala Cys Ala Lys Phe

20 25 30

Thr Cys

<210> 17
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<400> 17

Pro Ala Phe Val Cys Arg Gln Gly Val Val Asp Arg Gly Trp Gly Asn
1 5 10 15

Gly Cys Gly Leu Phe Gly Lys Gly Ser Ile Asp Thr Cys Ala Lys Phe
20 25 30

Ala Cys

<210> 18
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<400> 18

Lys Gly Lys Tyr Asn Thr Thr Leu Leu Asn Gly Ser Ala Phe Tyr Leu
1 5 10 15

Val Cys Pro Ile Gly Trp Thr Gly Val Ile Glu Cys Thr Ala Val Ser
20 25 30

Pro Thr

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<400> 19

Arg Gly Lys Phe Asn Thr Thr Leu Leu Asn Gly Pro Ala Phe Gln Met
1 5 10 15

Val Cys Pro Ile Gly Trp Thr Gly Thr Val Ser Cys Thr Ser Phe Asn
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Met Asp

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Arg Gly Lys Tyr Asn Ala Thr Leu Leu Asn Gly Ser Ala Phe Gln Leu
1 5 10 15

Val Cys Pro Tyr Glu Trp Thr Gly Arg Val Glu Cys Thr Thr Ile Ser
20 25 30

Lys Ser

<210> 21
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<400> 21

Ile His Ile Asp Leu Asn Glu Thr Gly Thr Cys Tyr Leu Glu Val Pro
1 5 10 15

Thr Gly Ile Asp Pro Gly Phe Leu Gly Phe Ile Gly Trp Met Ala Gly
20 25 30

Lys Val Glu Ala
35

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<400> 22

Met Val Leu Leu Gln Met Glu Asp Lys Ala Trp Leu Val His Arg Gln
1 5 10 15

Trp Phe Leu Asp Leu Pro Leu Pro Trp Leu Pro Gly Ala Asp Thr Gln
20 25 30

Gly Ser Asn Trp
35

<210> 23
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<400> 23

Phe Tyr Val Met Thr Val Gly Ser Lys Ser Phe Leu Val His Arg Glu
1 5 10 15

Trp Phe His Asp Leu Ala Leu Pro Trp Thr Ser Pro Ser Ser Thr Ala
20 25 30

Trp Arg Asn Arg
35

<210> 24
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<400> 24

Ser Tyr Ile Ala Glu Met Glu Thr Glu Ser Trp Ile Val Asp Arg Gln
1 5 10 15

Trp Ala Gln Asp Leu Thr Leu Pro Trp Gln Ser Gly Ser Gly Gly Val
20 25 30

Trp Arg Glu Met
35

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<400> 25

Tyr Tyr Val Met Thr Val Gly Thr Lys Thr Phe Leu Val His Arg Glu
1 5 10 15

Trp Phe Met Asp Leu Asn Leu Pro Trp Ser Ser Ala Gly Ser Thr Val
20 25 30

Trp Arg Asn Arg
35

<210> 26
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carbohydrate

<400> 26

Thr Leu Arg Thr Glu Val Val Lys Thr Phe Arg Arg Asp Lys Pro Phe
1 5 10 15

Pro His Arg Met Asp Ala Val Thr Thr Thr Val Glu Asn Glu Asp Leu
20 25 30

Phe Tyr

<210> 27
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<400> 27

Thr Leu Ala Thr Glu Val Val Lys Ile Tyr Lys Arg Thr Lys Arg Phe
1 5 10 15

Arg Ser Gly Leu Val Ala Thr His Thr Thr Ile Tyr Glu Glu Asp Leu
20 25 30

Tyr His

<210> 28
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<400> 28

Thr Leu Ala Thr Thr Val Val Arg Thr Tyr Arg Arg Ser Lys Pro Phe
1 5 10 15

Pro His Arg Gln Gly Ala Ile Thr Gln Lys Asn Leu Gly Glu Asp Leu
20 25 30

His

<210> 29
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<400> 29

Trp Met Ala Gly Lys Val Glu Ala Val Ile Phe Leu Thr Lys Leu Ala
1 5 10 15

Ser Gln Val Pro Tyr Ala Ile Ala Thr Met Phe Ser Ser Val His Tyr
20 25 30

Leu Ala Val Gly Ala Leu Ile Tyr Tyr Ser
35 40

<210> 30
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<400> 30

Met Ala Ile Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Leu Gly Gly
1 5 10 15

Val Phe Thr Ser Ile Gly Lys Ala Leu His Gln Val Phe Gly Ala Ile
20 25 30

Tyr Gly Ala Ala Phe Ser Gly Val Ser Trp
35 40

<210> 31
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<221> MOD_RES

<222> (42)..(42)
<223> The carboxy-terminal amino acid residue comprises a carboxyl group or one of the following groups: amido, hydrophobic, macromolecular, t-butyloxycarbonyl, lipid, polyethyleneglycol, or carbohydrate

<400> 31

Leu Ala Ala Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Ile Gly Gly
1 5 10 15

Val Phe Asn Ser Ile Gly Lys Ala Val His Gln Val Phe Gly Gly Ala
20 25 30

Phe Arg Thr Leu Phe Gly Gly Met Ser Trp
35 40

<210> 32
<211> 42
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<220>
<221> MOD_RES
<222> (1)..(1)
<223> The amino-terminal amino acid residue comprises an amino group or is modified to contain one of the following groups: acetyl, hydrophobic, macromolecular, carbobenzoxyl, dansyl, t-butyloxycarbonyl, lipid, polyethylene glycol, or carbohydrate

<220>
<221> MOD_RES
<222> (42)..(42)
<223> The carboxy-terminal amino acid residue comprises a carboxyl group or one of the following groups: amido, hydrophobic, macromolecular, t-butyloxycarbonyl, lipid, polyethyleneglycol, or carbohydrate

<400> 32

Leu Ala Val Met Gly Asp Thr Ala Trp Asp Phe Ser Ser Ala Gly Gly
1 5 10 15

Phe Phe Thr Ser Val Gly Lys Gly Ile His Thr Val Phe Gly Ser Ala
20 25 30

Phe Gln Gly Leu Phe Gly Gly Leu Asn Trp
35 40

<210> 33
<211> 42
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<220>
<221> MOD_RES
<222> (1)..(1)
<223> The amino-terminal amino acid residue comprises an amino group or is modified to contain one of the following groups: acetyl, hydrophobic, macromolecular, carbobenzoxyl, dansyl, t-butyloxycarbonyl, lipid, polyethylene glycol, or carbohydrate

<220>
<221> MOD_RES
<222> (42)..(42)
<223> The carboxy-terminal amino acid residue comprises a carboxyl group or one of the following groups: amido, hydrophobic, macromolecular, t-butyloxycarbonyl, lipid, polyethyleneglycol, or carbohydrate

<400> 33

Leu Ala Ala Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly
1 5 10 15

Val Phe Thr Ser Val Gly Lys Ala Val His Gln Val Phe Gly Gly Ala
20 25 30

Phe Arg Ser Leu Phe Gly Gly Met Ser Trp
35 40

<210> 34
<211> 42
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<220>
<221> MOD_RES
<222> (1)..(1)
<223> The amino-terminal amino acid residue comprises an amino group or is modified to contain one of the following groups: acetyl, hydrophobic, macromolecular, carbobenzoxyl, dansyl, t-butyloxycarbonyl, lipid, polyethylene glycol, or carbohydrate

<220>
<221> MOD_RES
<222> (42)..(42)
<223> The carboxy-terminal amino acid residue comprises a carboxyl group or one of the following groups: amido, hydrophobic, macromolecular, t-butyloxycarbonyl, lipid, polyethyleneglycol, or carbohydrate

<400> 34

Gln Gln Tyr Met Leu Lys Gly Glu Tyr Gln Tyr Trp Phe Asp Leu Asp

1 5 10 15

Val Thr Asp Arg His Ser Asp Tyr Phe Ala Glu Phe Val Val Leu Val
20 25 30

Val Val Ala Leu Leu Gly Gly Arg Tyr Ile
35 40

<210> 35
<211> 42
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<220>
<221> MOD_RES
<222> (1)..(1)
<223> The amino-terminal amino acid residue comprises an amino group or is modified to contain one of the following groups: acetyl, hydrophobic, macromolecular, carbobenzoxyl, dansyl, t-butyloxycarbonyl, lipid, polyethylene glycol, or carbohydrate

<220>
<221> MOD_RES
<222> (42)..(42)
<223> The carboxy-terminal amino acid residue comprises a carboxyl group or one of the following groups: amido, hydrophobic, macromolecular, t-butyloxycarbonyl, lipid, polyethyleneglycol, or carbohydrate

<400> 35

Gln Gln Tyr Met Leu Lys Gly Glu Tyr Gln Tyr Trp Phe Asp Leu Glu
1 5 10 15

Val Thr Asp His His Arg Asp Tyr Phe Ala Glu Ser Ile Leu Val Val
20 25 30

Val Val Ala Leu Leu Gly Gly Arg Tyr Val
35 40

<210> 36
<211> 43
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<220>
<221> MOD_RES
<222> (1)..(1)
<223> The amino-terminal amino acid residue comprises an amino group or is modified to contain one of the following groups: acetyl, hydrophobic, macromolecular, carbobenzoxyl, dansyl,

t-butyloxycarbonyl, lipid, polyethylene glycol, or carbohydrate

<220>
<221> MOD_RES
<222> (43)..(43)
<223> The carboxy-terminal amino acid residue comprises a carboxyl group or one of the following groups: amido, hydrophobic, macromolecular, t-butyloxycarbonyl, lipid, polyethyleneglycol, or carbohydrate

<400> 36

Gln Gln Tyr Met Leu Lys Gly Gln Tyr Gln Tyr Trp Phe Asp Leu Glu
1 5 10 15

Val Ile Ser Ser Thr His Gln Ile Asp Leu Thr Glu Phe Ile Met Leu
20 25 30

Ala Val Val Ala Leu Leu Gly Gly Arg Tyr Val
35 40

<210> 37
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<220>
<221> misc_feature
<222> (2)..(2)
<223> Xaa can be any naturally occurring amino acid

<400> 37

Arg Xaa Arg Lys Arg
1 5

<210> 38
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 38

Ser Cys Leu Thr Val Pro Ala Ser Ala Tyr Gln Val Arg Asn Ser Ser
1 5 10 15

Gly Leu

<210> 39
<211> 18

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 39

Ser Ala Tyr Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn
1 5 10 15

Asp Cys

<210> 40
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 40

Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys Pro Asn Ser Ser Ile
1 5 10 15

Val Tyr

<210> 41
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 41

Thr Asn Asp Cys Pro Asn Ser Ser Val Val Tyr Glu Ala Ala Asp Ala
1 5 10 15

Ile Leu

<210> 42
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 42

Ser Ile Val Tyr Glu Ala Ala Asp Ala Ile Leu His Thr Pro Gly Cys

1 5 10 15

Val Pro

<210> 43
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 43

Asp Ala Ile Leu His Thr Pro Gly Cys Val Pro Cys Val Arg Glu Gly
1 5 10 15

Asn Ala

<210> 44
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 44

Gly Cys Val Pro Cys Val Arg Glu Gly Asn Ala Ser Arg Cys Trp Val
1 5 10 15

Ala Val

<210> 45
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 45

Trp Val Ala Val Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro
1 5 10 15

Thr Thr

<210> 46
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 46

Trp Val Ala Val Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro
1 5 10 15

Thr Thr

<210> 47
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 47

Val Ala Thr Arg Asp Gly Lys Leu Pro Thr Thr Gln Leu Arg Arg His
1 5 10 15

Ile Asp

<210> 48
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 48

Leu Pro Thr Thr Gln Leu Arg Arg His Ile Asp Leu Leu Val Gly Ser
1 5 10 15

Ala Thr

<210> 49
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 49

Arg His Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys Ser Ala Leu
1 5 10 15

Tyr Val

<210> 50
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 50

Gly Ser Ala Thr Leu Cys Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly
1 5 10 15

Ser Val

<210> 51
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 51

Ala Leu Tyr Val Gly Asp Leu Cys Gly Ser Val Phe Leu Val Gly Gln
1 5 10 15

Leu Phe

<210> 52
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 52

Cys Gly Ser Val Phe Leu Val Gly Gln Leu Phe Thr Phe Ser Pro Arg
1 5 10 15

His His

<210> 53
<211> 18
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 53

Gly Gln Leu Phe Thr Phe Ser Pro Arg His His Trp Thr Thr Gln Asp
1 5 10 15

Cys Asn

<210> 54
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 54

Pro Arg His His Trp Thr Thr Gln Asp Cys Asn Cys Ser Ile Tyr Pro
1 5 10 15

Gly His

<210> 55
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 55

Gln Asp Cys Asn Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Arg
1 5 10 15

Met Ala

<210> 56
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 56

Tyr Pro Gly His Ile Thr Gly His Arg Met Ala Asn Met Met Met Asn
1 5 10 15

Trp

<210> 57
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 57

His Arg Met Ala Asn Met Met Met Asn Trp Ser Pro Thr Ala Ala Leu
1 5 10 15

Val

<210> 58
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 58

Met Met Asn Trp Ser Pro Thr Ala Ala Leu Val Val Ala Gln Leu Leu
1 5 10 15

Arg Ile

<210> 59
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 59

Ala Ala Leu Val Val Ala Gln Leu Leu Arg Ile Pro Gln Ala Ile Met
1 5 10 15

Asp Met

<210> 60
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 60

Leu Leu Arg Ile Pro Gln Ala Ile Met Asp Met Ile Ala Gly Ala His
1 5 10 15

Trp Gly

<210> 61
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 61

Ile Met Asp Met Ile Ala Gly Ala His Trp Gly Val Leu Ala Gly Ile
1 5 10 15

Lys Tyr

<210> 62
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 62

Ala His Trp Gly Val Leu Ala Gly Ile Lys Tyr Phe Ser Met Val Gly
1 5 10 15

Asn Trp

<210> 63
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 63

Gly Ile Lys Tyr Phe Ser Met Val Gly Asn Trp Ala Lys Val Leu Val
1 5 10 15

Val Leu

<210> 64

<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 64

Val Gly Asn Trp Ala Lys Val Leu Val Val Leu Leu Leu Phe Ala Gly
1 5 10 15

Val Asp

<210> 65
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 65

Leu Val Val Leu Leu Leu Phe Ala Gly Val Asp Ala Glu Thr His Val
1 5 10 15

Thr Gly

<210> 66
<211> 496
<212> PRT
<213> Tick borne encephalitis virus

<400> 66

Ser Arg Cys Thr His Leu Glu Asn Arg Asp Phe Val Thr Gly Thr Gln
1 5 10 15

Gly Thr Thr Arg Val Thr Leu Val Leu Glu Leu Gly Gly Cys Val Thr
20 25 30

Ile Thr Ala Glu Gly Lys Pro Ser Met Asp Val Trp Leu Asp Ala Ile
35 40 45

Tyr Gln Glu Asn Pro Ala Lys Thr Arg Glu Tyr Cys Leu His Ala Lys
50 55 60

Leu Ser Asp Thr Lys Val Ala Ala Arg Cys Pro Thr Met Gly Pro Ala
65 70 75 80

Thr Leu Ala Glu Glu His Gln Gly Gly Thr Val Cys Lys Arg Asp Gln
85 90 95

Ser Asp Arg Gly Trp Gly Asn His Cys Gly Leu Phe Gly Lys Gly Ser

```
            100                 105                 110

Ile Val Ala Cys Val Lys Ala Ala Cys Glu Ala Lys Lys Lys Ala Thr
        115                 120                 125

Gly His Val Tyr Asp Ala Asn Lys Ile Val Tyr Thr Val Lys Val Glu
    130                 135                 140

Pro His Thr Gly Asp Tyr Val Ala Ala Asn Glu Thr His Ser Gly Arg
145                 150                 155                 160

Lys Thr Ala Ser Phe Thr Ile Ser Ser Glu Lys Thr Ile Leu Thr Met
                165                 170                 175

Gly Glu Tyr Gly Asp Val Ser Leu Leu Cys Arg Val Ala Ser Gly Val
            180                 185                 190

Asp Leu Ala Gln Thr Val Ile Leu Glu Leu Asp Lys Thr Val Glu His
        195                 200                 205

Leu Pro Thr Ala Trp Gln Val His Arg Asp Trp Phe Asn Asp Leu Ala
    210                 215                 220

Leu Pro Trp Lys His Glu Gly Ala Gln Asn Trp Asn Asn Ala Glu Arg
225                 230                 235                 240

Leu Val Glu Phe Gly Ala Pro His Ala Val Lys Met Asp Val Tyr Asn
                245                 250                 255

Leu Gly Asp Gln Thr Gly Val Leu Leu Lys Ala Leu Ala Gly Val Pro
            260                 265                 270

Val Ala His Ile Glu Gly Thr Lys Tyr His Leu Lys Ser Gly His Val
        275                 280                 285

Thr Cys Glu Val Gly Leu Glu Lys Leu Lys Met Lys Gly Leu Thr Tyr
    290                 295                 300

Thr Met Cys Asp Lys Thr Lys Phe Thr Trp Lys Arg Ile Ala Thr Asp
305                 310                 315                 320

Ser Gly His Asp Thr Val Val Met Glu Val Thr Phe Ser Gly Thr Lys
                325                 330                 335

Pro Cys Arg Ile Pro Val Arg Ala Val Ala His Gly Ser Pro Asp Val
            340                 345                 350

Asn Val Ala Met Leu Ile Thr Pro Asn Pro Thr Ile Glu Asn Asn Gly
        355                 360                 365

Gly Gly Phe Ile Glu Met Gln Leu Pro Pro Gly Asp Asn Ile Ile Tyr
    370                 375                 380

Val Gly Glu Leu Ser His Gln Trp Phe Gln Lys Gly Ser Ser Ile Gly
385                 390                 395                 400

Arg Val Phe Gln Lys Thr Arg Lys Gly Ile Glu Arg Leu Thr Val Ile
```

405 410 415

Gly Glu His Ala Trp Asp Phe Gly Ser Ala Gly Gly Phe Leu Ser Ser
420 425 430

Ile Gly Lys Ala Val His Thr Val Leu Gly Gly Ala Phe Asn Ser Ile
435 440 445

Phe Gly Gly Val Gly Phe Leu Pro Lys Leu Leu Leu Gly Val Ala Leu
450 455 460

Ala Trp Leu Gly Leu Asn Met Arg Asn Pro Thr Met Ser Met Ser Phe
465 470 475 480

Leu Leu Ala Gly Gly Leu Val Leu Ala Met Thr Leu Gly Val Gly Ala
485 490 495

<210> 67
<211> 168
<212> PRT
<213> Hepatitis C virus

<400> 67

Tyr Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys
1 5 10 15

Pro Asn Ser Ser Val Val Tyr Glu Ala Ala Asp Ala Ile Leu His Thr
20 25 30

Pro Gly Cys Val Pro Cys Val Arg Glu Gly Asn Ala Ser Arg Cys Trp
35 40 45

Val Ala Val Thr Pro Thr Val Ala Thr Arg Gly Lys Leu Pro Thr Thr
50 55 60

Gln Leu Arg Arg His Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys
65 70 75 80

Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Ser Val Phe Leu Val Gly
85 90 95

Gln Leu Phe Thr Phe Ser Pro Arg His His Trp Thr Thr Gln Asp Cys
100 105 110

Asn Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Arg Met Ala Trp
115 120 125

Asn Met Met Met Asn Trp Ser Pro Thr Ala Ala Leu Val Val Ala Gln
130 135 140

Leu Leu Arg Ile Pro Gln Ala Ile Met Asp Met Ile Ala Gly Ala His
145 150 155 160

Trp Gly Val Leu Ala Gly Ile Lys
165

<210> 68
<211> 366
<212> PRT
<213> Classical swine fever virus

<400> 68

Gly Gln Leu Ala Cys Lys Glu Asp Tyr Arg Tyr Ala Ile Ser Ser Thr
1 5 10 15

Asn Glu Ile Gly Leu Leu Gly Ala Gly Gly Leu Thr Thr Thr Trp Lys
20 25 30

Glu Tyr Asn Asp Leu Gln Leu Asn Asp Gly Thr Val Lys Ile Cys Val
35 40 45

Ala Gly Ser Phe Lys Val Thr Ala Leu Asn Val Val Ser Arg Arg Tyr
50 55 60

Val Leu Ala Ser Leu His Lys Lys Ala Leu Pro Ile Ser Val Thr Phe
65 70 75 80

Glu Leu Leu Phe Asp Gly Thr Asn Pro Ser Thr Glu Glu Met Glu Asp
85 90 95

Asp Phe Gly Phe Gly Leu Cys Pro Phe Asp Thr Ser Pro Val Val Lys
100 105 110

Gly Lys Tyr Asn Thr Thr Leu Leu Asn Gly Ser Ala Phe Tyr Leu Val
115 120 125

Cys Pro Ile Gly Trp Thr Gly Val Ile Glu Cys Thr Ala Val Ser Pro
130 135 140

Thr Thr Leu Arg Thr Glu Val Val Lys Thr Phe Arg Arg Asp Lys Pro
145 150 155 160

Phe Pro His Arg Met Asp Cys Val Thr Thr Thr Val Glu Asn Glu Asp
165 170 175

Leu Phe Tyr Cys Lys Leu Gly Gly Asn Trp Thr Cys Val Lys Gly Glu
180 185 190

Pro Val Val Tyr Thr Gly Gly Val Val Lys Gln Cys Arg Trp Cys Gly
195 200 205

Phe Asp Phe Asn Glu Pro Asp Gly Leu Pro His Tyr Pro Ile Gly Lys
210 215 220

Cys Ile Leu Ala Asn Glu Thr Gly Tyr Arg Ile Val Asp Ser Thr Asp
225 230 235 240

Cys Asn Arg Asp Gly Val Val Ile Ser Thr Glu Gly Ser His Glu Cys
245 250 255

Leu Ile Gly Asn Thr Thr Val Lys Val His Ala Ser Asp Glu Arg Leu
260 265 270

```
Gly Pro Met Pro Cys Arg Pro Lys Glu Ile Val Ser Ser Ala Gly Pro
        275                 280                 285

Val Arg Lys Thr Ser Cys Thr Phe Asn Tyr Ala Lys Thr Leu Lys Asn
    290                 295                 300

Lys Tyr Tyr Glu Pro Arg Asp Ser Tyr Phe Gln Gln Tyr Met Leu Lys
305                 310                 315                 320

Gly Glu Tyr Gln Tyr Trp Phe Asp Leu Asp Val Thr Asp Arg His Ser
                325                 330                 335

Asp Tyr Phe Ala Glu Phe Val Val Leu Val Val Val Ala Leu Leu Gly
            340                 345                 350

Gly Arg Tyr Ile Leu Trp Leu Ile Val Thr Tyr Ile Val Leu
        355                 360                 365
```

<210> 69
<211> 90
<212> PRT
<213> Hepatitis C virus

<400> 69

```
Tyr Phe Ser Met Val Gly Asn Trp Ala Lys Val Leu Val Val Leu Leu
1               5                   10                  15

Leu Phe Ala Gly Val Asp Ala Glu Thr His Val Thr Gly Gly Asn Ala
            20                  25                  30

Gly Arg Thr Thr Ala Gly Leu Val Gly Leu Leu Thr Pro Gly Ala Lys
        35                  40                  45

Gln Asn Ile Gln Leu Ile Asn Thr Asn Gly Ser Trp His Ile Asn Ser
    50                  55                  60

Thr Ala Leu Asn Cys Asn Glu Ser Leu Asn Thr Gly Trp Leu Ala Gly
65                  70                  75                  80

Leu Phe Tyr Gln His Lys Phe Asn Ser Ser
                85                  90
```

<210> 70
<211> 89
<212> PRT
<213> Hepatitis C virus

<400> 70

```
Gly Cys Pro Glu Arg Leu Ala Ser Cys Arg Arg Leu Thr Asp Phe Ala
1               5                   10                  15

Gln Gly Trp Gly Pro Ile Ser Tyr Ala Asn Gly Ser Gly Leu Asp Glu
            20                  25                  30
```

```
Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Pro Cys Gly Ile Val Pro
        35                  40                  45

Ala Lys Ser Val Cys Gly Pro Val Tyr Cys Phe Thr Pro Ser Val Val
    50                  55                  60

Val Gly Thr Thr Asp Arg Ser Gly Ala Pro Thr Tyr Ser Trp Gly Ala
65                  70                  75                  80

Asn Asp Thr Asp Val Phe Val Leu Asn
                85
```

<210> 71
<211> 195
<212> PRT
<213> Hepatitis C virus

<400> 71

```
Trp Phe Gly Cys Thr Trp Met Asn Ser Thr Gly Phe Thr Lys Val Cys
1               5                   10                  15

Gly Ala Pro Pro Cys Val Ile Gly Gly Val Gly Asn Asn Thr Leu Leu
            20                  25                  30

Cys Pro Thr Asp Cys Phe Arg Lys Tyr Pro Glu Ala Thr Tyr Ser Arg
        35                  40                  45

Cys Gly Ser Gly Pro Arg Ile Thr Pro Arg Cys Met Val Asp Tyr Pro
    50                  55                  60

Tyr Arg Leu Trp His Tyr Pro Cys Thr Ile Asn Tyr Thr Ile Phe Lys
65                  70                  75                  80

Val Arg Met Tyr Val Gly Gly Val Glu His Arg Leu Glu Ala Ala Cys
                85                  90                  95

Asn Trp Thr Arg Gly Glu Arg Cys Asp Leu Glu Asp Arg Asp Arg Ser
            100                 105                 110

Glu Leu Ser Pro Leu Leu Leu Ser Thr Thr Gln Trp Gln Val Leu Pro
        115                 120                 125

Cys Ser Phe Thr Thr Leu Pro Ala Leu Ser Thr Gly Leu Ile His Leu
    130                 135                 140

His Gln Asn Ile Val Asp Val Gln Tyr Ile Tyr Gly Val Gly Ser Ser
145                 150                 155                 160

Ile Ala Ser Trp Ala Ile Lys Trp Glu Tyr Val Val Leu Leu Phe Leu
                165                 170                 175

Leu Leu Ala Asp Ala Arg Val Cys Ser Cys Leu Trp Met Met Leu Leu
            180                 185                 190

Ile Ser Gln
        195
```

<210> 72
<211> 167
<212> PRT
<213> Tick borne encephalitis virus

<400> 72

Thr Leu Ala Ala Thr Val Arg Lys Glu Arg Asp Gly Ser Thr Val Ile
1 5 10 15

Arg Ala Glu Gly Lys Asp Ala Ala Thr Gln Val Arg Val Glu Asn Gly
20 25 30

Thr Cys Val Ile Leu Ala Thr Asp Met Gly Ser Trp Cys Asp Asp Ser
35 40 45

Leu Ser Tyr Glu Cys Val Thr Ile Asp Gln Gly Glu Glu Pro Val Asp
50 55 60

Val Asp Cys Phe Cys Arg Asn Val Asp Gly Val Tyr Leu Glu Tyr Gly
65 70 75 80

Arg Cys Gly Lys Gln Glu Gly Ser Arg Thr Arg Arg Ser Val Leu Ile
85 90 95

Pro Ser His Ala Gln Gly Glu Leu Thr Gly Arg Gly His Lys Trp Leu
100 105 110

Glu Gly Asp Ser Leu Arg Thr His Leu Thr Arg Val Glu Gly Trp Val
115 120 125

Trp Lys Asn Lys Leu Leu Ala Leu Ala Met Val Thr Val Val Trp Leu
130 135 140

Thr Leu Glu Ser Val Val Thr Arg Val Ala Val Leu Val Val Leu Leu
145 150 155 160

Cys Leu Ala Pro Val Tyr Ala
165

<210> 73
<211> 194
<212> PRT
<213> Classical swine fever virus

<400> 73

Leu Ser Pro Tyr Cys Asn Val Thr Ser Lys Ile Gly Tyr Ile Trp Tyr
1 5 10 15

Thr Asn Asn Cys Thr Pro Ala Cys Leu Pro Lys Asn Thr Lys Ile Ile
20 25 30

Gly Pro Gly Lys Phe Asp Thr Asn Ala Glu Asp Gly Lys Ile Leu His
35 40 45

```
Glu Met Gly Gly His Leu Ser Glu Phe Leu Leu Leu Ser Leu Val Val
    50                  55                  60

Leu Ser Asp Phe Ala Pro Glu Thr Ala Ser Ala Leu Tyr Leu Ile Phe
65                  70                  75                  80

His Tyr Val Ile Pro Gln Ser His Glu Glu Pro Glu Gly Cys Asp Thr
                85                  90                  95

Asn Gln Leu Asn Leu Thr Val Glu Leu Arg Thr Glu Asp Val Ile Pro
            100                 105                 110

Ser Ser Val Trp Asn Val Gly Lys Tyr Val Cys Val Arg Pro Asp Trp
        115                 120                 125

Trp Pro Tyr Glu Thr Lys Val Ala Leu Leu Phe Glu Glu Ala Gly Gln
    130                 135                 140

Val Val Lys Leu Ala Leu Arg Ala Leu Arg Asp Leu Thr Arg Val Trp
145                 150                 155                 160

Asn Ser Ala Ser Thr Thr Ala Phe Leu Ile Cys Leu Ile Lys Val Leu
                165                 170                 175

Arg Gly Gln Ile Val Gln Gly Val Ile Trp Leu Leu Leu Val Thr Gly
            180                 185                 190

Ala Gln
```

<210> 74
<211> 198
<212> PRT
<213> Human immunodeficiency virus

<400> 74

```
Ala Val Gly Ile Gly Ala Leu Phe Leu Gly Phe Leu Gly Ala Ala Gly
1               5                   10                  15

Ser Thr Met Gly Ala Ala Ser Met Thr Leu Thr Val Gln Ala Arg Gln
            20                  25                  30

Ile Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala Ile
        35                  40                  45

Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln
    50                  55                  60

Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln
65                  70                  75                  80

Leu Leu Gly Ile Trp Gly Cys Ser Gly Lys Leu Ile Cys Thr Thr Ala
                85                  90                  95

Val Pro Trp Asn Ala Ser Trp Ser Asn Lys Ser Leu Glu Gln Ile Trp
            100                 105                 110
```

Asn His Thr Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr Thr
115 120 125

Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu Lys
130 135 140

Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp Asn
145 150 155 160

Trp Phe Asn Ile Thr Asn Trp Leu Trp Tyr Ile Leu Phe Ile Met Ile
165 170 175

Val Gly Gly Leu Val Gly Leu Arg Ile Val Phe Ala Val Leu Ser Ile
180 185 190

Val Asn Arg Val Arg Gln
195

<210> 75
<211> 190
<212> PRT
<213> Hepatitis C virus

<400> 75

Tyr Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys
1 5 10 15

Pro Asn Ser Ser Val Val Tyr Glu Ala Ala Asp Ala Ile Leu His Thr
20 25 30

Pro Gly Cys Val Pro Cys Val Arg Glu Gly Asn Ala Ser Arg Cys Trp
35 40 45

Val Ala Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro Thr Thr
50 55 60

Gln Leu Arg Arg His Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys
65 70 75 80

Ser Ala Leu Tyr Trp Val Gly Asp Leu Cys Gly Ser Val Phe Leu Val
85 90 95

Gly Gln Leu Phe Thr Phe Ser Pro Arg His His Trp Thr Thr Gln Asp
100 105 110

Cys Asn Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Arg Met Ala
115 120 125

Trp Asn Met Met Met Asn Trp Ser Pro Thr Ala Ala Val Val Ala Gln
130 135 140

Leu Leu Arg Ile Pro Ala Ile Met Asp Met Ile Ala Gly Ala His Trp
145 150 155 160

Gly Val Leu Ala Gly Ile Lys Tyr Phe Ser Met Val Gly Asn Trp Ala

165 170 175

Lys Val Leu Val Val Leu Leu Leu Phe Ala Gly Val Asp Ala
180 185 190